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 MORI TOSHIKI

(54) RESIN COMPOSITION FOR FORMING FILM

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a resin composition reducing the formation of a gel regarded as a fish eye in a formed film, and providing an adhesive film suitable for an electronic or electric part.

SOLUTION: This resin composition for forming the film contains (A) a copolymer containing [a] a vinyl group-containing monomer unit and [b] an epoxy group-containing unit, (B) a polymerization initiator and (C) an antioxidant. The insulating material is obtained by curing the composition.

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TITLE: Resin composition comprises copolymer containing units derived from monomers having vinyl groups containing no epoxy and ester groups, polymerization initiator, antoxidation agent, and fatty acid and/or salt

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PATENT-ASSIGNEE: SUMITOMO CHEM CO LTD [SUMO]

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ABSTRACTED-PUB-NO: WO2003037953A

BASIC-ABSTRACT:

NOVELTY - Resin composition comprises (A) copolymer containing units (a) derived from monomers having vinyl groups containing no epoxy and ester groups and units (b) derived from monomer containing vinyl and epoxy groups, (B) polymerization initiator, (C) antioxidation agent, and (D) 0.05 parts by weight of fatty acid and/or salt based on 100 parts by weight of (A).

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

- (1) an insulating material obtained by curing the resin;
- (2) a similar material obtained by optically curing the resin composition and then heat curing at 110-250 deg. C;
- (3) a copper foil having the resin applied theron or a printed circuit board containing the insulation material; and
- (4) a method of printed circuit board by irradiating a printed circuit board using a laser to form through holes.

USE - For forming insulating films for printed circuit boards.

ADVANTAGE - The composition prevents the formation of gels when the film is formed.

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 TI Epoxy group-containing vinyl copolymer resin compositions useful for elec. insulating materials
 IN Iyama, Hironobu; Fujiki, Toru; Mori, Toshiki
 PA Sumitomo Chemical Company, Limited, Japan
 SO PCT Int. Appl., 35 pp.
 CODEN: PIXXD2
 DT Patent
 LA Japanese
 IC ICM C08G059-20
 ICS C08G059-68; G03F007-028; G03F007-038; H01B003-40
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PI WO 2003037953	A1	20030508	WO 2002-JP11224	20021029
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JP 2003137969	A	20030514	JP 2001-334333	20011031 <--
PRAI JP 2001-334333	A	20011031		

AB Title compns. comprise (A) 100 parts copolymers containing units originated from vinyl group-containing, but not epoxy and ester group monomers, and units originated from vinyl and epoxy group-containing monomers, (B) polymerization initiators, (C) antioxidants, and optionally (D) ≤0.05 parts fatty acids and/or their salts. Thus, a composition comprising Bondfast E ethylene-glycidyl methacrylate copolymer 100, SP 150 polymerization catalyst 3, Irganox 1076 0.1, Irgafos 168 0.1, Sumilizer GP 0.05, and Denka Black HS 100 acetylene black 0.05 parts was kneaded and processed into a film with number of fish eye gel 76/10 g.

ST epoxy contg vinyl copolymer resin compn elec insulator Bondfast
 IT Fluoropolymers, uses
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
 (blend with epoxy group-containing vinyl copolymers; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)

IT Polyoxyalkylenes, uses
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
 (blend with fluoropolymer and epoxy group-containing vinyl copolymer; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)

IT Electric insulators
 Plastic films
 Printed circuit boards
 Solder resists
 (epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)

IT Polymer blends
 RL: TEM (Technical or engineered material use); USES (Uses)
 (epoxy group-containing vinyl copolymers and fluoropolymers and optionally polyoxyalkylenes; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)

IT Fluoro rubber
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
 (hexafluoropropene-vinylidene fluoride, Dynamar PPA FX 9613, blend with epoxy group-containing vinyl copolymers; epoxy group-containing vinyl copolymer
 resin compns. useful for elec. insulating materials)

IT 25190-89-0, Hexafluoropropylene-tetrafluoroethylene-vinylidene fluoride

- copolymer
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(Dynamar FX 5911X, blend with epoxy group-containing vinyl copolymer; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)
- IT 7631-86-9, Silica, uses
RL: MOA (Modifier or additive use); USES (Uses)
(amorphous; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)
- IT 190454-49-0, Dynamar PPA-FX 5920A
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(blend with epoxy group-containing vinyl copolymer; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)
- IT 25322-68-3, Polyethylene glycol
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(blend with fluoropolymer and epoxy group-containing vinyl copolymer; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)
- IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(blend with polyethylene glycol and epoxy group-containing vinyl copolymer; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)
- IT 471-34-1, Calcium carbonate, uses 14807-96-6, Talc, uses
RL: MOA (Modifier or additive use); USES (Uses)
(epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)
- IT 26061-90-5, Bondfast E
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)
(optionally blend with fluoropolymer and optionally polyethylene glycol; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)
- IT 7440-50-8, Copper, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; epoxy group-containing vinyl copolymer resin compns. useful for elec. insulating materials)

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2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the insulating material which comes to harden the film molding resin constituent containing an epoxy group content olefin system copolymer, a polymerization initiator, and an antioxidant, and this constituent.

[0002]

[Description of the Prior Art] Many adhesive insulating materials, such as a solder resist and a layer insulation ingredient, are used for the printed wired board. After these insulating materials were supplied as a varnish containing a solvent and formed an insulating layer conventionally, they were what removes a solvent by desiccation and is obtained. the purport which adhesion of electronic parts and the adhesive film for production of an integrated circuit can acquire by irradiating an electron ray to the constituent which consists of rosin which the film material which does not contain a solvent is proposed from a viewpoint of a productivity drive and a work environment improvement recently, for example, has an ethylene-glycidyl methacrylate copolymer, an ethylene-methacrylate ester copolymer, and a carboxyl group in JP,10-316955,A -- it is indicated.

[0003]

[Problem(s) to be Solved by the Invention] When this invention persons did film shaping using an epoxy group content copolymer like an ethylene-glycidyl methacrylate copolymer, the gel called a "fish eye" by heating at the time of shaping generated, and it became clear that the problem from which a film appearance becomes poor may arise. The purpose of this invention is offering the resin constituent with which generating of the gel at the time of film shaping is controlled.

[0004]

[Means for Solving the Problem] This invention is a film molding resin constituent containing (A), (following B), and following (C) component.

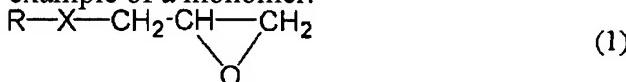
(A) The copolymer (B) polymerization initiator (C) antioxidant containing a vinyl group content monomeric unit [a] and an epoxy group content monomeric unit [b] **[0005]**

[Embodiment of the Invention] Hereafter, this invention is explained to a detail. The component (A) used for this invention is a copolymer which uses a vinyl group content monomeric unit [a] and an epoxy group content monomeric unit [b] as a principal component. Moreover, the partial saturation ester compound unit [c] etc. may be contained as a monomeric unit of this copolymer. The content of the epoxy group content monomeric unit [b] in a component (A) is usually 1 - 150 weight section extent to the vinyl group content monomeric unit [a] 100 weight section, and is 1 - 50 weight section extent preferably. Moreover, when it contains a partial saturation ester compound unit [c] in a component (A), the content of [c] is usually below 250 weight sections extent to the vinyl group content monomeric unit [a] 100 weight section, and 0 - 60 weight section extent is suitable for it especially.

[0006] If a vinyl group content monomeric unit [a] is a monomeric unit equivalent to the vinyl compound which does not contain an epoxy group and an ester group and the example of a monomer is given Ethylene; A propylene, 1-butene, 4-methyl-1-pentene, 1-hexene, The alpha olefin of alpha olefin;

ethylene and alpha olefins, such as a propylene, such as 1-heptene, 1-octene, 1-nonene, and 1-decene, obtained by copolymerizing; Styrene, Aromatic series vinyl, such as alpha methyl styrene and a divinylbenzene; conjugated diene compounds, such as a butadiene and an isoprene, acrylonitrile, a vinyl chloride, etc. are mentioned. Here, an alpha olefin expresses with an end the chain-like hydrocarbon which has a double bond. [a] The alpha olefin obtained by ethylene and an alpha olefin being desirable especially as a monomer equivalent to a component, dividing, and carrying out the polymerization of the ethylene, the alpha olefin obtained by carrying out the polymerization of the propylene, or the alpha olefin obtained by copolymerizing ethylene and a propylene is suitable.

[0007] An epoxy group content monomeric unit [b] is a monomeric unit equivalent to the compound containing an epoxy group, is a monomeric unit equivalent to a vinyl group content monomer or its polymer, and the compound that may be copolymerized, and is the following general formula (1) as an example of a monomer.



(-- R expresses the alkenyl radical of carbon numbers 2-18 among a formula, and X expresses carboxyloxy group, a methylene oxy-radical, or a phenyleneoxy radical.) -- the alkenyl compound containing the epoxy group expressed etc. is mentioned.

[0008] [b] As a monomer equivalent to a component, especially, partial saturation glycidyl ether, such as unsaturated-carboxylic-acid glycidyl ester, such as metaglycidyl acrylate, glycidyl methacrylate, and itaconic-acid glycidyl, and allyl glycidyl ether, meta-allyl glycidyl ether, and styrene-p-glycidyl ether, is desirable, and divide and glycidyl acrylate, glycidyl methacrylate, etc. are suitable.

[0009] Partial saturation ester compound units [c] are partial saturation ester compounds other than the above-mentioned unsaturated-carboxylic-acid glycidyl ester, and, specifically, unsaturated-carboxylic-acid alkyl ester, such as saturation carboxylic-acid vinyl ester; methyl acrylates, such as vinyl acetate, propionic-acid vinyl, and butanoic acid vinyl, an ethyl acrylate, butyl acrylate, a methyl methacrylate, ethyl methacrylate, and methacrylic-acid butyl, etc. is mentioned. Especially, vinyl acetate, a methyl acrylate, an ethyl acrylate, a methyl methacrylate, etc. are suitable.

[0010] The components (A) in this invention are the block copolymer of the monomeric unit which constitutes a component (A), a graft copolymer, a random copolymer, an alternating copolymer, etc. The copolymer which specifically carried out the graft of the epoxy group content monomeric unit [a] to the propylene-ethylene block copolymer (block copolymer of a vinyl group content monomeric unit [a]) given in the patent No. 2632980 official report, The copolymer which carried out the graft of the partial saturation ester compound unit [c] to the copolymer (copolymer of [a] and [b]) of an ethylene-epoxy group content monomeric unit given in the patent No. 2600248 official report, The copolymer which carried out the graft of the acrylonitrile styrene copolymer (copolymer of [a]) to the polymer [b] of an epoxy group content monomeric unit given in JP,6-51767,B is illustrated.

[0011] As the manufacture approach of a component (A), for example A vinyl group content monomeric unit [a], It responds to an epoxy group content monomeric unit [b] and a pan at the need. Monomeric units, such as a partial saturation ester compound unit [c], under existence of a radical generating agent $5 \times 10^7 - 4 \times 10^8$ Pa (500 to 4000 atmospheric pressure) extent, about 100-300 degrees C, How to carry out copolymerization to the bottom of existence of a suitable solvent and a chain transfer agent or un-existing, Monomeric units, such as [c], etc. are added further if needed, it mixes with a radical generating agent, and a monomeric unit [b], the approach of carrying out melting graft copolymerization in an extruder, etc. are mentioned to the polymer of [a], such as an alpha olefin obtained by carrying out the polymerization of ethylene and/or the propylene.

[0012] as the melt viscosity of a component (A) -- usually -- 180 degrees C and shear rate 1.2×10^2 sec⁻¹ -- setting -- 50 - 1000 Pa-s extent -- it is -- desirable -- 80 - 900 Pa-s extent -- it is 200 - 800 Pa-s extent especially preferably. There is an inclination for the pewter thermal resistance of the insulating material obtained as the melt viscosity of a component (A) is more than 50 Pa-s to improve, and there is an inclination for the fluidity of the resin constituent obtained as it is below 1000 Pa-s to improve. In

addition, the melt viscosity measured by this invention is JIS K 7199. It is the value applied correspondingly and measured. In the approach of preparing the molecular weight of a component (A) by the well-known manufacture approach in order to consider as the melt viscosity of a request of a component (A), and the method of mixing two or more kinds of copolymers containing a vinyl group content monomeric unit [a] and an epoxy group content monomeric unit [b], and obtaining a component (A), each melt viscosity is measured and the method of adjusting the amount of mixing of each copolymer based on each melt viscosity etc. is mentioned.

[0013] As a component (A), the copolymer of marketing, such as for example, "bond first (Sumitomo Chemical make)" series, may be used. The number average molecular weight of the component (A) obtained in this way is the polystyrene conversion measured with gel permeation chromatography (GPC), and is usually 10,000 to about 100,000. And it is 0.5-600g / about 10 minutes, and the melt index (JIS K6760) is divided and it is usually desirable that they are 2-50g / about 10 minutes.

[0014] Although the component (B) in this invention is the compound which can carry out polymerization initiation of the epoxy group and/or vinyl group which are contained in a component (A) and anionic initiator; light radical polymerization initiator; heat radical polymerization initiators, such as a cationic initiator; imidazole system compound and a carbamate system compound, etc. are specifically mentioned, from a viewpoint of a cure rate, a cationic initiator and an optical radical polymerization initiator are desirable, and a cationic initiator is especially suitable.

[0015] As a cationic initiator, it is aromatic series sulfonium, aromatic series iodonium, aromatic series diazonium; aromatic series ammonium, and eta 5, for example. - They are at least one kind of cation chosen from a cyclo PENTA gel-eta6-KUMENIRU-Fe salt system etc., BF4- and PF6-, SbF6-, and the following general formula (2).

[BY4-] (2)

(Y expresses among a formula the phenyl group by which a fluorine or at least two trifluoromethyl radicals or more were permuted.) etc. -- from -- the onium salt which consists of at least one kind of anions chosen is mentioned.

[0016] As a cationic initiator of an aromatic series sulfonium salt system For example, bis[4-(diphenyl SURUHONIO) phenyl] sulfide Screw hexafluorophosphate, Bis[4-(diphenyl SURUHONIO) phenyl] sulfide Screw hexafluoroantimonate, Bis[4-(diphenyl SURUHONIO) phenyl] sulfide Screw tetrafluoroborate, Bis[4-(diphenyl SURUHONIO) phenyl] sulfide Tetrakis (pentafluorophenyl) borate, (2-ethoxy-1-methyl-2-oxo-ethyl) Methyl-2-North America Free Trade Agreement RENIRU sulfonium Hexafluorophosphate, (2-ethoxy-1-methyl-2-oxo-ethyl) Methyl-2-North America Free Trade Agreement RENIRU sulfonium Hexafluoro ACHIMONETO, (2-ethoxy-1-methyl-2-oxo-ethyl) Methyl-2-North America Free Trade Agreement RENIRU sulfonium Tetrafluoroborate, (2-ethoxy-1-methyl-2-oxo-ethyl) Methyl-2-North America Free Trade Agreement RENIRU sulfonium Tetrakis (pentafluorophenyl) borate, Diphenyl-4-(phenylthio) phenyl sulfonium Hexafluorophosphate, Diphenyl-4-(phenylthio) phenyl sulfonium Hexafluoro ACHIMONETO, Diphenyl-4-(phenylthio) phenyl sulfonium Tetrafluoroborate, Diphenyl-4-(phenylthio) phenyl sulfonium Tetrakis (pentafluorophenyl) borate, Triphenylsulfonium hexafluorophosphate, triphenylsulfonium hexafluoroantimonate, Triphenylsulfonium tetrafluoroborate, triphenylsulfonium tetrakis (pentafluorophenyl) borate, Bis[4-(JI (4- (2-hydroxy ethoxy)) phenyl SURUHONIO) phenyl] sulfide Screw hexafluorophosphate, Bis[4-(JI (4- (2-hydroxy ethoxy)) phenyl SURUHONIO) phenyl] sulfide Screw hexafluoroantimonate, Bis[4-(JI (4- (2-hydroxy ethoxy)) phenyl SURUHONIO) phenyl] sulfide Screw tetrafluoroborate, Bis[4-(JI (4- (2-hydroxy ethoxy)) phenyl SURUHONIO) phenyl] sulfide Tetrakis (pentafluorophenyl) borate etc. is mentioned.

[0017] As a cationic initiator of an aromatic series iodonium salt system For example, diphenyliodonium Hexafluorophosphate, Diphenyliodonium Hexafluoroantimonate, diphenyliodonium Tetrafluoroborate, Diphenyliodonium Tetrakis (pentafluorophenyl) borate, Bis(dodecyl phenyl) iodonium Hexafluorophosphate, Bis(dodecyl phenyl) iodonium Hexafluoroantimonate, Bis(dodecyl phenyl) iodonium Tetrafluoroborate, Bis(dodecyl phenyl) iodonium Tetrakis (pentafluorophenyl) borate, 4-methylphenyl-4-(1-methylethyl) phenyliodonium Hexafluorophosphate, 4-methylphenyl-4-(1-

methyl ethyl) phenyliodonium Hexafluoroantimonate, 4-methylphenyl-4-(1-methyl ethyl) phenyliodonium Tetrafluoroborate, 4-methylphenyl-4-(1-methyl ethyl) phenyliodonium Tetrakis (pentafluorophenyl) borate etc. is mentioned.

[0018] As a cationic initiator of an aromatic series diazonium salt system, it is phenyl diazonium, for example. Hexafluorophosphate, phenyl diazonium Hexafluoroantimonate, phenyl diazonium Tetrafluoroborate, phenyl diazonium Tetrakis (pentafluorophenyl) borate etc. is mentioned.

[0019] As a cationic initiator of an aromatic series ammonium salt system For example, 1-benzyl-2-cyano pyridinium Hexafluorophosphate, 1-benzyl-2-cyano pyridinium Hexafluoroantimonate, 1-benzyl-2-cyano pyridinium Tetrafluoroborate, 1-benzyl-2-cyano pyridinium Tetrakis (pentafluorophenyl) borate, 1-(naphthyl methyl)-2-cyano pyridinium Hexafluorophosphate, 1-(naphthyl methyl)-2-cyano pyridinium Hexafluoroantimonate, 1-(naphthyl methyl)-2-cyano pyridinium Tetrafluoroborate, 1-(naphthyl methyl)-2-cyano pyridinium tetrakis (pentafluorophenyl) borate, etc. are mentioned.

[0020] eta 5 - as a cationic initiator of a cyclo PENTA gel-eta6-KUMENIRU-Fe salt system For example, eta5-cyclo PENTA gel-eta6-KUMENIRU-Fe(II) hexafluorophosphate, eta5-cyclo PENTA gel-eta6-KUMENIRU-Fe(II) hexafluoroantimonate, eta5-cyclo PENTA gel-eta6-KUMENIRU-Fe(II) tetrafluoroborate, eta5-cyclo PENTA gel-eta6-KUMENIRU-Fe(II) tetrakis (pentafluorophenyl) borate, etc. are mentioned.

[0021] The cationic initiator of a commercial item may be used as a cationic initiator. Specifically "UVI-6990" (mixture of Union Carbide screw [4-(diphenyl SURUHONIO) phenyl] sulfide screw hexafluorophosphate and triphenylsulfonium hexafluorophosphate), "UVACURE 1591" (mixture of the screw [4-(diphenyl SURUHONIO) phenyl] sulfide screw hexafluorophosphate made from die cel you SHIBI, and triphenylsulfonium hexafluorophosphate), "UVI-6974" (mixture of Union Carbide screw [4-(diphenyl SURUHONIO) phenyl] sulfide screw hexafluoroantimonate and triphenylsulfonium hexafluoroantimonate), "SP-150" (screw [4-(JI (4-(2-hydroxy ethoxy) phenyl SURUHONIO) phenyl] sulfide screw hexafluorophosphate made from the Asahi electrification), "SP-170" (screw [4-(JI (4-(2-hydroxy ethoxy) phenyl SURUHONIO) phenyl] sulfide screw hexafluoroantimonate made from the Asahi electrification) "CI-5102" (Nippon Soda make), "CI-2855" (Nippon Soda make), "CI-2639" (Nippon Soda make), "CI-2624" (Nippon Soda make), "SAN-AID SI-60L" (3 Japanese Federation of Chemical Industry Workers' Unions make), "SAN-AID SI-80L" (3 Japanese Federation of Chemical Industry Workers' Unions make), "SAN-AID SI-100L" (3 Japanese Federation of Chemical Industry Workers' Unions make), "FC-508" (product made from 3M), "FC-512" (product made from 3M), "IRGACURE 261"([(2, 4-cyclopentadiene-1-IRU) (1-methyl ethyl) benzene]-Fe (II) hexafluorophosphate made from tiba SUPESHARUTI KEMIKARUZU), "The load sill (RHODORSIL) 2074 etc." (Rhone-Poulenc 4-methylphenyl-4-(1-methyl ethyl) phenyliodonium tetrakis (pentafluorophenyl) borate) is illustrated.

[0022] As an optical radical polymerization initiator, for example 2 and 2-dimethoxy -1, 2-bibenzyl-1-ON, 1-hydroxy-1-cyclohexyl phenyl ketone, 2-hydroxy - 2-methyl-1-phenyl propane-1-ON, 1-[4-(2-hydroxy ethoxy) phenyl]-2-hydroxy-isobutane-1-ON, 2-methyl - 1-[4-(methylthio) phenyl]-2-morpholino propane-1-ON, 2-benzyl-2-dimethylamino -1 -(4-morpholino phenyl)- Butane-1-ON, Screw (2, 6-dimethoxybenzoyl) - 2, 4, and 4-trimethyl pentyl phosphine oxide, bis(2, 6-dimethoxybenzoyl)-phenyl phosphine oxide, etc. are mentioned.

[0023] As a polymerization initiator (B) in this invention, two or more sorts of different polymerization initiators may be used. The onium salt whose anion is PF₆- when using a cationic initiator is desirable, and it is especially aromatic series sulfonium. Hexafluorophosphate is suitable.

[0024] The loadings of the polymerization initiator (B) in the constituent of this invention are 0.3 - 10 weight section extent to the (Component A) 100 weight section, and its 0.3 - 5 weight section extent is desirable especially. When a component (B) is more than the 0.3 weight section, since it is in the inclination whose pewter thermal resistance improves, it is desirable, and, in below 10 weight sections, desirable. [be in the inclination for an unreacted polymerization initiator to decrease in the obtained insulating material and]

[0025] This invention can control the yield of the gel called a "fish eye" by making a component (C)

contain. Components (C) are antioxidants, such as a phenolic antioxidant, the Lynn system antioxidant, a sulfur system antioxidant, and an amine system antioxidant. Although a component (C) may be one kind of antioxidant, in order that it may make the gel prevention effectiveness and the coloring prevention effectiveness improve, it is desirable to use together at least two kinds of antioxidants chosen from a phenolic antioxidant, the Lynn system antioxidant, and a sulfur system antioxidant especially, and it is desirable to divide and to use together three kinds of antioxidants, a phenolic antioxidant, the Lynn system antioxidant, and a sulfur system antioxidant.

[0026] As a phenolic antioxidant, for example 2,6-di-tert-butyl-4-methylphenol, 2,6-di-t-butyl-4-ethylphenol, 2,6-dicyclohexyl-4-methyl phenol, 2,6-G t-amyl-4-methyl phenol, 2, a 6-G t-octyl-4-n-propyl phenol, 2,6-dicyclohexyl-4-n-octyl phenol, 2-isopropyl-4-methyl-6-t-butylphenol, 2-t-butyl-2-ethyl-6-t-octyl phenol, 2 - Isobutyl-4-ethyl-6-t-hexyl phenol, 2 - Cyclohexyl-4-n-butyl-6-isopropyl phenol, dl-alpha-tocopherol, t-butyl hydroquinone, 2, and 2'-methylenebis (4-methyl-6-t-butylphenol), 4 and 4'-butylidenebis (3-methyl-6-t-butylphenol), A - thio screw (3-methyl-6-t-butylphenol), and 4 and 4' 2, 2'-thio screw (4-methyl-6-t-butylphenol), A - methylenebis [6-(1-methylcyclohexyl)-p-cresol], and 4 and 4'-methylenebis (2,6-G t-butylphenol), 2, and 2' 2, 2'-ethylidene screw (4, 6-G t-butylphenol),

[0027] 2 and 2'-butylidenebis (2-t-butyl-4-methyl phenol), 2-t-butyl-6-(3-t-butyl-2-hydroxy-5-methylbenzyl)-4-methylphenyl acrylate, 2-[1-(2-hydroxy - 3, 5-G t-pentyl phenyl) ethyl]-4, 6-G t-pentyl phenyl acrylate, 1, 1, 3-tris (2-methyl-4-hydroxy-5-t-butylphenyl) butane, A triethylene glycol screw [3-(3-t-butyl-5-methyl-4-hydroxyphenyl) propionate], A 1,6-hexanediol screw [3-(3, 5-G t-butyl-4-hydroxyphenyl) propionate], 2 and 2-thio diethylene screw [3-(3, 5-G t-butyl-4-hydroxyphenyl) propionate], N and N'-hexa methylenebis (3 5-G t-butyl-4-hydroxy-hydronium SHINNAMIDO), 3,5-di-t-butyl-4-hydroxybenzylphosphonate diethylester, Tris (2 6-dimethyl-3-hydroxy-4-t-butylbenzyl) isocyanurate, Tris (3, 5-G t-butyl-4-hydroxybenzyl) isocyanurate, tris [(3, 5-G t-butyl-4-hydroxyphenyl) propionyloxy ethyl] isocyanurate, [0028] Tris (4-t-butyl -2, 6-dimethyl-3-hydroxybenzyl) isocyanurate, 2, 4-screw -6 (n-octylthio) -(4-hydroxy - 3, 5-G t-butylanilino)- 1,3,5-triazine, Tetrakis [methylene-3-(3, 5-G t-butyl-4-hydroxyphenyl) propionate] methane, 2 and 2'-methylenebis (4-methyl-6-t-butylphenol) terephthalate, 1, 3, 5-trimethyl -2, 4, 6-tris (3, 5-G t-butyl-4-hydroxybenzyl) benzene, 3, 9-screw [1 and 1-dimethyl-2-{beta-(3-t-butyl-4-hydroxy-5-methylphenyl) propionyloxy} ethyl]-tetraoxaspiro [2, 4, 8, and 10-] [5, 5] undecane, A 2 and 2-bis[4-(2- (3, 5-G t-butyl-4-hydroxy hydronium cinnamoyloxy)) ethoxy phenyl] propane, beta-(3, 5-G t-butyl-4-hydroxyphenyl) propionic-acid stearyl ester, etc. are mentioned.

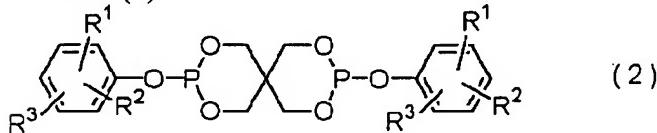
[0029] In these, beta-(3, 5-G t-butyl-4-hydroxyphenyl) propionic-acid stearyl ester, Tetrakis [methylene-3-(3, 5-G t-butyl-4-hydroxyphenyl) propionate] methane, Tris (3, 5-G t-butyl-4-hydroxybenzyl) isocyanurate, 1, 3, 5-trimethyl -2, 4, 6-tris (3, 5-G t-butyl-4-hydroxybenzyl) benzene, dl-alpha-tocopherol, tris (2 6-dimethyl-3-hydroxy-4-t-butylbenzyl) isocyanurate, Tris [(3, 5-G t-butyl-4-hydroxyphenyl) propionyloxy ethyl] isocyanurate, 3 and 9-screw [1 and 1-dimethyl-2-{beta-(3-t-butyl-4-hydroxy-5-methylphenyl) propionyloxy} ethyl]-tetraoxaspiro [2, 4, 8, and 10-] [5, 5] undecane is desirable.

[0030] The phenolic antioxidant of a commercial item may be used as a phenolic antioxidant. For example, IRUGA NOx 1010 (Irganox [1010], product made from tiba SUPESHARUTI KEMIKARUZU), IRUGA NOx 1076 (Irganox [1076], product made from tiba SUPESHARUTI KEMIKARUZU), IRUGA NOx 1330 (Irganox [1330], product made from tiba SUPESHARUTI KEMIKARUZU), IRUGA NOx 3114 (Irganox [3114], product made from tiba SUPESHARUTI KEMIKARUZU), IRUGA NOx 3125 (Irganox [3125], product made from tiba SUPESHARUTI KEMIKARUZU), SUMIRAIZA BHT (Sumilizer BHT, Sumitomo Chemical make), SHIANOKKUSU 1790 (Cyanox [1790], product made from SAITEKKU), Sumi Reiser GA-80 (Sumilizer GA-80, Sumitomo Chemical make), vitamin E (Eisai make), etc. are mentioned.

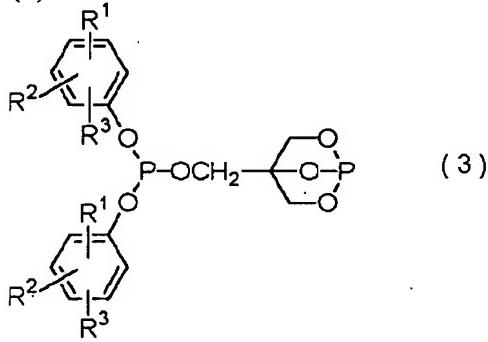
[0031] As a phenolic antioxidant, two or more kinds of phenolic antioxidants may be used. The loadings of the phenolic antioxidant in the constituent of this invention should receive the (Component A) 100 weight section. usually, 0.005 - 2 weight section -- desirable -- 0.01 - 1 weight section -- it is the 0.05 - 0.5 weight section still more preferably.

[0032] As a Lynn system anti-oxidant, for example Trioctyl phosphite, trilauryl phosphite, Tridecyl phosphite, diphenyl (octyl) phosphite, tris (2, 4-G t-butylphenyl) phosphite, Triphenyl phosphite, tris (butoxy ethyl) phosphite, Tris (nonylphenyl) phosphite, distearyl pentaerythritoldiphosphite, Tetrapod (tridecyl) - 1, 1, 3-tris (2-methyl-5-t-butyl-4-hydroxyphenyl) butane diphosphite, A tetrapod (C12 - C15 mixing alkyl) -4, 4'-isopropylidenediphenyldiphosphite, A tetrapod (tridecyl) -4, 4'-butylidenebis (3-methyl-6-t-butylphenol) diphosphite, tris (3, 5-G t-butyl-4-hydroxyphenyl) phosphite, tris (monochrome JI mixing nonylphenyl) phosphite, [0033] Hydrogenation -4, 4'-isopropylidene diphenol poly phosphite, Bis(octyl phenyl) screw [4 and 4'-butylidenebis (3-methyl-6-t-butylphenol)]-1,6-hexanediol diphosphite, Phenyl (4 and 4'-isopropylidene diphenol) pentaerythritoldiphosphite, Distearyl pentaerythritoldiphosphite, tris [4 and 4'-isopropylidene screw (2-t-butylphenol)] phosphite, JI (isodecyl) phenyl phosphite, 4, and 4'-isopropylidene bis(2-t-butylphenol) bis(nonylphenyl) phosphite, 9, 10-dihydro-9-OKISA-10-phosphaphenanthrene-10-oxide, A bis(2, 4-G t-butyl-6-methylphenyl) ethyl FOSU fight, 2-[{2, 4 and 8, 10-tetra--t-butyl JIBENZU[d, f --] -- [- 1.3.2 --] - dioxaphosphepine - six - IRU --} -- oxy-one --] - N -- N - a screw -- [-- two - [- {2, 4 and 8, and 10- tetra--t-butyl JIBENZU [d, f][1.3.2]-dioxaphosphepine-6-IRU} oxy-] ethyl] -- ethane -- an amine -- 6-[3-(3-t-butyl-4-hydroxy-5-methylphenyl) propoxy]-2, 4 and 8, 10-tetra--t-butyl JIBENZU [d, f] [1.3.2]-dioxaphosphepine, etc. are mentioned.

[0034] Moreover, as bis(dialkyl phenyl) pentaerythritoldiphosphite ester, it is the following general formula (2).



(-- R1, R2, and R3 express a hydrogen atom or a with a carbon number of about one to nine alkyl group independently among a formula, respectively.) -- the spiro mold shown or the following general formula (3)



(-- R1, R2, and R3 express the same semantics as the above among a formula.) -- the thing of the cage form shown etc. is mentioned. As for such phosphite ester, a general formula (2) and the mixture of (3) are usually used.

[0035] Here, when R1, R2, and R3 are alkyl groups, an alkyl group with branching is desirable and t-butyl is suitable especially. Moreover, 2 and the 4 or 6th place of the permutation location of R1, R2, and R3 in a phenyl group are desirable.

[0036] As a HOSUFO night with the structure which bis(2,4-di-tert-butylphenyl) pentaerythritoldiphosphite, bis(2, 6-G t-butyl-4-methylphenyl) pentaerythritoldiphosphite, bis(nonylphenyl)pentaerythritoldiphosphite, etc. were mentioned, and carbon and Lynn coupled directly as an example of phosphite ester, compounds, such as tetrakis (2, 4-G t-butylphenyl) -4 and 4'-biphenylene diphosphonite, are mentioned, for example.

[0037] A commercial item can also be used as a Lynn system antioxidant. For example, IRUGAFOSU 168 (Irgafos [168], product made from tiba SUPESHARUTI KEMIKARUZU), IRUGAFOSU 12 (Irgafos [12], product made from tiba SUPESHARUTI KEMIKARUZU), IRUGAFOSU 38 (Irgafos

[38], product made from tiba SUPESHARUTI KEMIKARUZU), ADEKA stub 329K (ADK STAB 329K, product made from the Asahi electrification), The ADEKA stub PEP 36 (ADK STAB PEP [36], product made from the Asahi electrification) ADEKA stub PEP-8 (ADK STAB PEP-8, product made from the Asahi electrification), Sandstab P-EPQ (Clariant make), Weston 618 (Weston [618], product made from GE), Weston 619G (Weston 619G, product made from GE), ultra NOx 626 (Ultranox [626], product made from GE), Sumi Reiser GP (Sumilizer GP, Sumitomo Chemical make), etc. are mentioned.

[0038] As a Lynn system antioxidant, two or more kinds of Lynn system antioxidants may be used. the loadings of the Lynn system antioxidant in the constituent of this invention -- the (Component A) 100 weight section -- receiving -- usually -- 0.005 - 2 weight section -- desirable -- 0.01 - 1 weight section -- it is the 0.05 - 0.5 weight section still more preferably.

[0039] In the Lynn system anti-oxidant, tris (2, 4-G t-butylphenyl) phosphite, Tetrakis (2, 4-G t-butylphenyl) -4, 4'-biphenylene diphosphonite, Distearyl pentaerythritoldiphosphite, bis(2,4-di-tert-butylphenyl)pentaerythritoldiphosphite, 2-[{2, 4 and 8, 10-tetra--t-butyl JIBENZU[d, f --] -- [- 1.3.2 --] - dioxaphosphhepine - six - IRU --} -- oxy-one --] - N -- N - a screw -- [-- two - [- {2, 4 and 8, and 10-tetra--t-butyl JIBENZU [d, f][1.3.2]-dioxaphosphhepine-6-IRU} oxy-] ethyl] -- ethane -- an amine -- 6-[3-(3-t-butyl-4-hydroxy-5-methylphenyl) propoxy]-2, 4 and 8, and 10-tetra--t-butyl JIBENZU [d, f] [1.3.2]-dioxaphosphhepine are desirable.

[0040] As a sulfur system anti-oxidant, the ester (for example, pen TAERI thrill tetrakis-3-laurylthio propionate) of the polyhydric alcohol (for example, a glycerol, trimethylolethane, trimethylol propane, pentaerythritol, tris hydroxyethyl isocyanurate) of alkylthio propionic acids, such as dialkyl thiodipropionate, such as dilauryl -, dimyristyl -, and distearyl -, and butyl -, octyl -, lauryl -, and stearyl -, etc. is mentioned, for example.

[0041] Dilauryl thiodipropionate, dimyristyl thiodipropionate, distearyl thiodipropionate, lauryl stearyl thiodipropionate, distearyl CHIOJI butyrate, etc. are still more specifically mentioned. In these, pen TAERI thrill tetrakis-3-laurylthio propionate is desirable.

[0042] A commercial item can also be used as a sulfur system antioxidant, for example, Sumi Reiser TPS (Sumilizer TPS, Sumitomo Chemical make), Sumi Reiser TPL-R (SumilizerTPL-R, Sumitomo Chemical make), Sumi Reiser TPM (Sumilizer TPM, Sumitomo Chemical make), Sumi Reiser TP-D (Sumilizer TP-D, Sumitomo Chemical make), etc. are mentioned. As a sulfur system antioxidant, two or more kinds of sulfur system antioxidants may be used. the loadings of the sulfur system antioxidant in the constituent of this invention -- the (Component A) 100 weight section -- receiving -- 0.005 - 2 weight section -- it is preferably desirable 0.01 - 1 weight section and to consider as the 0.05 - 0.5 weight section still more preferably.

[0043] as an amine system anti-oxidant -- 2, 2, 4-trimethyl-1, the polymerization object of a 2-dihydroquinoline, and 6-ethoxy - 2, 2, 4-trimethyl-1, a 2-dihydroquinoline, and N-(1, 3-dimethyl butyl)-N -- 'the - phenyl -1, 4-phenylenediamine, and N-isopropyl-N' -- the - phenyl -1, 4-phenylenediamine, etc. are mentioned.

[0044] Alkali resistance can be made to improve by making the film molding resin constituent of this invention contain a fluororesin as lubricant. Alkali resistance is an index showing the ability of the insulating material obtained from this constituent by the alkaline penetrant remover etc. not to exfoliate easily from adherend here. As a fluororesin, a vinylidene fluoride tetrafluoroethylene hexafluoropropylene copolymer, a vinylidene fluoride hexafluoropropylene copolymer, etc. are mentioned, for example. The vinylidene fluoride tetrafluoroethylene hexafluoropropylene copolymer which is excellent in thermal resistance and chemical resistance especially is suitable. As a fluororesin, commercial items, such as for example, the "die NAMA PPA (product made from 3M)" series, can be used. As a content of the fluororesin in the constituent of this invention, it is usually 0 - 5 weight section extent to the (Component A) 100 weight section, and is 0.001 - 0.05 weight section extent preferably. Moreover, it is desirable to add as a masterbatch from a viewpoint of securing the dispersibility of a fluororesin.

[0045] By the way, although a fatty-acid salt and/or fatty acids, such as stearic acid, calcium stearate,

and zinc stearate, are used as lubricant in case they fabricate an epoxy group content olefin system copolymer, the sum total content of the fatty-acid salt in the resin constituent of this invention and a fatty acid is usually under the 0.05 weight sections to the (Component A) 100 weight section, and it is preferably desirable not to especially contain a fatty-acid salt and a fatty acid substantially under the 0.03 weight section. Since it is in the inclination for gel to increase to the Plastic solid which fabricates the resin constituent of this invention in the shape of a film, and is acquired, and for film workability to fall when a fatty-acid salt and a fatty acid contain more than the 0.05 weight section, it is not desirable. [0046] the case where it is used for the film molding resin constituent of this invention as a solder resist etc. -- the conductor of the front face of a printed wired board -- in order to carry out the mask of the circuit, coloring matter, such as Phthalocyanine Green and carbon black, a pigment, etc. may be contained.

[0047] The film molding resin constituent of this invention may be made to contain a sensitizer if needed. As a sensitizer, a pyrene, perylene, 2, 4-diethylthio xanthone, phenothiazin, etc. are mentioned, for example. Considering a sensitizer as a content, it is usually 0 - 10 weight section extent to the (Component A) 100 weight section.

[0048] The film molding resin constituent of this invention may be made to contain a compounding agent if needed. As a compounding agent, reinforcing agents, such as a reaction diluent, thermoplastics, thermosetting resin, a thermostabilizer, a weathering agent, light stabilizer, a nucleating additive, a release agent, a flame retarder, a thickener, a leveling agent, a defoaming agent, an adhesion grant agent, an antistatic agent, a bulking agent, and glass fiber, etc. are mentioned.

[0049] As the manufacture approach of the film molding resin constituent of this invention, the approach of blending and blending a component (A), (B), (C), an additive, etc. to mixers which blend a component (A), (B), (C), an additive, etc., and carry out melting kneading with an extruder etc., such as an approach and a Henschel mixer, etc. is mentioned, for example. As the film-ized approach of a film molding resin constituent, the approach of fabricating this resin constituent with an extrusion-molding machine, the approach of carrying out after extrusion molding which pelletized this resin constituent with the kneading machine are mentioned, and the T-die method, a tubular film process, etc. are specifically illustrated. The above-mentioned film thickness is usually about 10-500 micrometers.

[0050] An adhesive insulating material can be obtained by hardening the film obtained in this way. When hardening is heat curing, the hardening condition is usually conditions of extent which can activate components (B), such as a heat cationic initiator and a heat radical initiator, and, specifically, is 5 minutes - about 1 hour at about 150-200 degrees C preferably in about 90-250 degrees C for 5 seconds to about 2 hours. Moreover, the insulating material which heat-hardens and is obtained from a viewpoint which maintains surface smooth nature under the pressurization of a press machine etc. is desirable.

[0051] When hardening is photo-curing, the hardening condition is usually conditions of extent which can activate components (B), such as an optical cationic initiator and an optical radical initiator. If the hardening condition is concretely explained by the manufacture approach of a solder resist After covering to a printed wired board, film-izing a (a) film molding resin constituent, and heating it, To the approach and (b) printed wired board which carry out photo-curing, a hot melt applicator, It covers carrying out heating fusion of the film molding resin constituent by a hot melt coating machine etc. Then, the approach of carrying out photo-curing, (c) polypropylene, a 4-methyl-1-pentene copolymer, The film which carried out the laminating of thermoplastics and film molding resin constituents, such as polyethylene terephthalate, polytetrafluoroethylene, and an ethylene tetrafluoroethylene copolymer, to two-layer is created. After it film-ized the approach (d) film molding resin constituent which makes the layer of thermoplastics the front face of this resin constituent layer and the front face of a printed wired board exfoliate after carrying out photo-curing, lamination and and it carries out photo-curing, the approach a printed wired board is made to cover is mentioned heating.

[0052] Also in the manufacture approach of the insulating material obtained by carrying out photo-curing, like above (a) - (c), after covering a film molding resin constituent to a printed wired board, the approach of carrying out photo-curing is desirable, it divides and the approach of (a) is suitable. Moreover, in approaches a printed wired board is made to cover after carrying out photo-curing of the

film molding resin constituent, such as the approach of (d), the constituent by which photo-curing was carried out has the desirable approach of covering to a printed wired board promptly.

[0053] As a beam of light to which photo-curing of the film molding resin constituent is carried out, the beam of light which can activate components (B), such as a cationic initiator and an optical radical initiator, is mentioned by ultraviolet rays, a visible ray, infrared radiation, ***** etc., for example. Moreover, as an exposure of a beam of light, it is usually about two 0.1 - 10,000 mJ/cm.

[0054] The thing which made about 110-250 degrees C of hardened materials obtained by carrying out photo-curing especially heat-harden further at about 150-200 degrees C preferably is suitable for the film molding resin constituent of this invention as an insulating material in order to make pewter thermal resistance improve. the insulating material obtained in this way -- a solder resist and a conductor -- the time of carrying out the laminating of the circuitry layer -- a conductor -- the layer insulation ingredient insulated securing the adhesive property between circuitry layers, and a conductor -- it can be used as a charge of an insulating binder the electrical and electric equipment and for electronic parts, such as resin for copper foil with resin, and a die bonding sheet, which has the copper foil coat which can form a circuit.

[0055] Beer formation usually according [the solder resist of this invention] to laser is carried out. As laser used, carbon dioxide laser etc. is mentioned, for example. Laser has the energy of 20 - 40mJ extent, and usually carries it out by the short pulse for about about 10-4 to 10 to 8 seconds. The shots per hour of a pulse required for beer formation is usually about about 5-100 shots.

[0056]

Example Next, this invention is not limited by these, although an example is shown and this invention is further explained to a detail. In addition, as long as there is no notice especially, there are weight criteria among the following examples with % and the section.

[0057] The following copolymer was used as a <component (A)> component (A).

A1: Ethylene glycidyl methacrylate copolymer (bond first [by Sumitomo Chemical Co., Ltd.] E, ethylene unit = 100 section, glycidyl methacrylate unit = 13.6 section)

A2: What was pelletized after carrying out melting kneading of the above A1 at 160-170 degrees C using the extruder which equipped with the screen pack of 300 meshes [0058] The following cationic initiator was used as a <component (B)> component (B).

B: SP-150 (screw [4-(JI (4- (2-hydroxy ethoxy)) phenyl SURUHONIO) phenyl] sulfide screw hexafluorophosphate, product made from the Asahi electrification)

[0059] <Component (C)> The following antioxidant was used.

C1: beta-(3, 5-G t-butyl-4-hydroxyphenyl) propionic-acid stearyl ester (a phenolic antioxidant, Irganox1076 made from tiba SUPESHARUTI KEMIKARUZU)

C2: Tris (2, 4-G t-butylphenyl) phosphite (the Lynn system anti-oxidant and Irgafos 168 made from tiba SUPESHARUTI KEMIKARUZU)

C3: 6-[3-(3-t-butyl-4-hydroxy-5-methylphenyl) propoxy]-2, 4 and 8, 10-tetra-t-butyl JIBENZU [d, f] [1.3.2]-dioxaephosphepine (the Lynn system antioxidant, Sumitomo Chemical Sumilizer GP)

C4: Pen TAERI thrill tetrakis-3-laurylthio propionate (a sulfur system antioxidant, Sumitomo Chemical Sumilizer TP-D)

[0060] <Fluororesin (D)> D1: Vinylidene fluoride tetrafluoroethylene hexafluoropropylene copolymer (die NAMA PPA FX-5911X made from 3M)

D2: A vinylidene fluoride hexafluoropropylene copolymer (28.5 - 31.5%), a polyethylene glycol (64 - 70%), talc (1 - 5%), a calcium carbonate (0.1 - 1%), mixture of an amorphous silica (0.1 - 1%) (die NAMA PPA FX-5920 made from 3M A)

D3: A vinylidene fluoride hexafluoropropylene copolymer (88 - 92%), talc (4 - 7%), a calcium carbonate (1 - 4%), mixture of an amorphous silica (2 - 4%) (product made from 3M die NAMA PPA FX-9613)

[0061] <Compounding-agent [other] (E)> E1: Carbon black (acetylene black, DIN made from electrochemistry a turnip rack HS- 100)

E2:calcium stearate E3: -- zinc stearate [0062] (Example 1 of manufacture of a film molding resin

constituent)

The dryblend of examples 1-5, the <examples 1-4 of comparison> component (A), a component (C), and the component (E) was measured and carried out by the ratio shown in Table 1. At 160 degrees C, melting kneading was carried out and the mixture and the (Component B):3 section which equipped with ***** and which were obtained using this direction biaxial extruder were pelletized. The pellet obtained in the example 1 of manufacture was processed into the film using T-die at 170 degrees C, and the monolayer film of about 50-micrometer thickness was obtained. Counting of the fish eye gel more than the diameter of 0.5mm in the obtained film was carried out visually, it converted into the number per film weight of 10g, and the result was summarized in Table 1.

[0063]

[Table 1]

	実施例1	実施例2	実施例3	実施例4	実施例5	比較例1	比較例2	比較例3	比較例4
A1 成分(A)		100	100	100	100				
A2	100					100	100	100	100
成分(B)	3	3	3	3	3	3	3	3	3
C1	0.1	0.1		0.1	0.05			0.1	0.1
C2	0.1	0.1						0.1	0.1
成分(C) C3	0.05	0.05		0.05	0.025				
C4			0.2	0.1	0.05				
E1	0.5	0.5	0.5	0.5	0.5		0.5	0.5	0.5
成分(E) E2								0.1	
E3									0.5
ゲル数 [個/10g]	76	48	46	57	51	103	120	-*	-*

-*: ゲルが多く、切れたりしてフィルム加工ができなかった。

[0064] (Example 2 of manufacture of a film molding resin constituent)

The dryblend of a component (C1), a component (C2), and the component (D) was measured and carried out by the ratio of the one section to the <examples 6-12> component (A2) 100 section, respectively. Using this direction biaxial extruder, after carrying out melting kneading at 160 degrees C, it pelletized, and the masterbatch of a component (D) was obtained. Dryblend was measured and carried out so that it might become the ratio which showed the masterbatch of the obtained component (D), the component (A), the component (C), and the component (E) in Table 2. It pelletized, after carrying out melting kneading of the mixture and the (Component B):3 section which equipped with ***** and which were obtained using this direction biaxial extruder at 160 degrees C. The pellet obtained in the example 2 of manufacture was processed into the film using T-die at 170 degrees C, and the monolayer film of about 50-micrometer thickness was obtained. Counting of the fish eye gel more than the diameter of 0.5mm in the obtained film was carried out visually, it converted into the number per film weight of 10g, and the result was summarized in Table 2.

[0065]

[Table 2]

	実施例6	実施例7	実施例8	実施例9	実施例10	実施例11	実施例12
成分(A) A1 A2					100	100	100
	100	100	100	100			
成分(B)	3	3	3	3	3	3	3
成分(C) C1 C2 C3 C4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
			0.1	0.1	0.1	0.1	0.1
	0.05	0.05	0.05	0.05			
	0.1	0.1					
成分(D) D1 D2 D3	0.005	0.01	0.005	0.01	0.005		
						0.005	
							0.005
成分(E) E1	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ゲル数 [個/10g]	51	50	54	74	73	72	97

[0066] The pewter heat resistance test and the alkali-proof trial were carried out in the following way, and the result was summarized in Table 3.

[0067] (Examples 13-15) Hitachi Chemical make which formed the circuit for the film of about 50-micrometer thickness obtained in an above-mentioned example 1 and an above-mentioned example 9 beforehand on 180 degrees C, 0.5MPa, and the conditions for 10 minutes Double-sided copper-clad laminate Thermocompression bonding was carried out to both sides of E679 (printed wired board). Then, product made from eye graphics Using the black light, it irradiated with the exposure of 800 mJ/cm², and the printed wired board with which the film was covered was obtained. The printed wired board furthermore obtained was heated for 30 minutes at 160 degrees C or 190 degrees C.

[0068] About the printed wired board with which the <pewter heat resistance test> film was covered, it is the Tabai Espec make. SOLDERABILITY TESTER It was immersed for 10 seconds to the 260-degree C pewter bath using EST-11. Visual observation of the surface appearance was carried out after 6 cycle repetition by making this into 1 cycle. In addition, the judgment followed the following criteria. O Thing x which does not have abnormalities (exfoliation, bulging) in :film appearance, and does not have pewter diving : what has abnormalities (exfoliation, bulging) in a film appearance, or has pewter diving in it [0069] The printed wired board with which the <alkali-proof trial> film was covered was immersed in 5% sodium-hydroxide water solution beforehand kept warm by 20 degrees C for 20 minutes. Then, after rinsing a printed wired board, visual observation of the surface appearance was carried out. In addition, the judgment followed the following criteria.

O Thing x which does not have abnormalities (exfoliation, bulging) in :film appearance : what has abnormalities (exfoliation, bulging) in a film appearance [0070]

[Table 3]

	実施例13	実施例14	実施例15
フィルム	実施例1	実施例9	
熱硬化温度	160°C	160°C	190°C
ハンダ耐熱性	○	○	○
耐アルカリ性	○	○	○

[0071]

[Effect of the Invention] The film molding resin constituent of this invention can control the fish eye gel generated at the time of heating at the time of film processing etc., and can give the insulating material of the shape of a good film of an appearance. Moreover, the obtained insulating material is excellent in pewter thermal resistance. Furthermore, the alkali resistance of the obtained insulating material can be made to improve by making this constituent contain a fluororesin. Since the insulating material obtained from the resin constituent of this invention gives the insulating material which has the outstanding insulation, it can be used for the solder resist which uses the laser beer forming method etc., a semiconductor package ingredient, a printed wired board, a layer insulation ingredient, copper foil with resin, a die bonding sheet, etc.

[Translation done.]

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The film molding resin constituent containing (A), (following B), and following (C) component.

(A) The copolymer (B) polymerization initiator (C) antioxidant containing a vinyl group content monomeric unit [a] and an epoxy group content monomeric unit [b] [claim 2] The constituent according to claim 1 characterized by a component (A) being the copolymer which contains the epoxy group content monomeric unit [b] 1 - the 150 weight sections to the vinyl group content monomeric unit [a] 100 weight section.

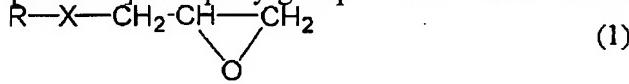
[Claim 3] The constituent according to claim 1 or 2 with which a component (A) is further characterized by being a copolymer containing a partial saturation ester compound unit [c].

[Claim 4] The constituent according to claim 3 with which the content of the partial saturation ester compound unit [c] in a component (A) is characterized by being below the 250 weight sections to the vinyl group content monomeric unit [a] 100 weight section.

[Claim 5] The constituent according to claim 1 to 4 characterized by a vinyl group content monomeric unit [a] being at least one kind of monomeric unit chosen from ethylene, an alpha olefin, aromatic series vinyl, and acrylonitrile.

[Claim 6] The constituent according to claim 5 characterized by an alpha olefin being an alpha olefin obtained by carrying out the polymerization of ethylene and/or the propylene.

[Claim 7] An epoxy group content monomeric unit [b] is the following general formula (1).



(-- R expresses the alkenyl radical of carbon numbers 2-18 among a formula, and X expresses carbonyloxy group, a methylene oxy-radical, or a phenyleneoxy radical.) -- constituent according to claim 1 to 6 characterized by being the epoxy group content monomeric unit expressed.

[Claim 8] The constituent according to claim 1 to 7 with which an epoxy group content monomeric unit [b] is characterized by being metaglycidyl acrylate or glycidyl methacrylate.

[Claim 9] The constituent according to claim 1 to 8 characterized by a component (B) being a cationic initiator or an optical radical polymerization initiator.

[Claim 10] At least a kind of cation as which a cationic initiator is chosen from aromatic series sulfonium, aromatic series iodonium, aromatic series diazonium, aromatic series ammonium, and an eta5-cyclo PENTA gel-eta6-KUMENIRU-Fe(II) system, BF4- and PF6-, SbF6-, and the following general formula (2)

[BY4-] (2)

(-- Y expresses among a formula the phenyl group by which a fluorine or at least two trifluoromethyl radicals or more were permuted.) -- from -- constituent according to claim 9 characterized by being onium salt which consists of at least one kind of anions chosen.

[Claim 11] The constituent according to claim 9 or 10 with which a cationic initiator is characterized by

being onium salt of PF6-.

[Claim 12] The constituent according to claim 1 to 11 characterized by a component (C) being at least one kind of antioxidant chosen from a phenolic antioxidant, the Lynn system antioxidant, and a sulfur system antioxidant.

[Claim 13] The constituent according to claim 1 to 12 characterized by containing a fluororesin.

[Claim 14] The constituent according to claim 13 with which a fluororesin is characterized by being the 3 yuan copolymer of vinylidene fluoride tetrafluoroethylene hexafluoropropylene.

[Claim 15] The constituent with which the content of the fatty-acid salt in a constituent according to claim 1 to 14 and/or a fatty acid is characterized by being below the 0.05 weight section to the (Component A) 100 weight section.

[Claim 16] The insulating material characterized by coming to harden a constituent according to claim 1 to 15.

[Claim 17] The insulating material characterized by coming to heat-harden at 110-250 degrees C after carrying out photo-curing of the constituent according to claim 1 to 15.

[Claim 18] The solder resist, the layer insulation ingredient, or resin for copper foil with resin characterized by being an insulating material according to claim 16 or 17.

[Claim 19] The printed wired board or copper foil with resin characterized by containing an insulating material according to claim 16 or 17.

[Claim 20] laser radiation -- carrying out -- the conductor of a printed wired board -- the laser beer formation approach characterized by using a printed wired board according to claim 19 in the laser beer formation approach which forms the through tube (beer) which reaches a circuit.

[Translation done.]